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10/505,157	04/28/2005	Akio Ozasa	12480-00055/US	5698
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/505,157

Applicant(s)

OZASA ET AL.

Examiner

ANISH DESAI

Art Unit

1794

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date 05/07/08.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's arguments in response to the Office action dated 11/27/08 have been fully considered.
2. Claims 1-22 are pending.
3. The 35 USC Section 102(b) or 103(a) rejections base don Doane et al. (US 5,861,216) are maintained.
4. The 35 USC Section 102(b) or 103(a) rejections based on Ando et al. (US 5,639,518) are withdrawn, because Ando does not teach or suggest a thermally softened coating film and "during the expansion molding so as to maintain the irregular surface of the biodegradable expanded molded article" as presently claimed.
5. A new 35 USC Section 103(a) rejection based on CA 2413432 (hereinafter CA 432) in view of Doane et al. (US 5,861,216) are made. It is noted that CA432 is provided by Applicant in the Information Disclosure Submitted on 05/07/08.

Claim Rejections - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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6. Claims 1, 3, 6, 14, 21, and 22 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Doane et al. (US 5,861,216) substantially as set forth in Section 5 of 11/27/07 Office Action, together with following additional observations.

7. The art rejections of Doane are disclosed in the previous Office Action and they are equally applicable. The presently amended claims include new claim limitations of molded article being molded by "steam expansion molding", the coating film is "thermally softened", and the thermally softened coating film is attached to the irregular surface of the biodegradable expanded molded article "during the expansion molding so as to maintain the irregular surface of the biodegradable expanded molded article". This Office Action only addresses the aforementioned new claim limitations.

8. It is noted that the Doane discloses biodegradable article that is formed of starch and polyvinyl alcohol and it is in expanded form (abstract). Further, the biodegradable article of Doane has a self-adherent, moisture resistant hydroxy-functional polyester coating film on the surface of the expanded biodegradable article (abstract and column 3 lines 1-50). It is noted that Doane discloses "When applying the hydroxy-functional polyester layer, some melting of the polymer will be necessary to adhere onto the surface of the self-supporting structure." (column 7 lines 15-25). This disclosure of Doane reads on the thermally softened coating film as presently claimed.

9. As to the claim requirements of a biodegradable expanded molded article molded by steam expansion molding and "a thermally softened coating film attached to the irregular surface of the biodegradable expanded molded article during the expansion

molding so as to maintain the irregular surface of the biodegradable expanded molded article", said requirements are directed to product by process limitations. The product by process claims are not limited to the manipulations of the recited steps, only the structure implied by the steps. "Even though product by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product by process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985).

10. Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. *In re Marosi*, 218 USPQ 289, 292 (Fed. Cir.1983). In the presently claimed invention, it is noted that the biodegradable molded article of Applicant is in the expanded form and has irregular surface. Additionally, a thermally softened film is applied to the biodegradable article such that the irregular surface of the biodegradable article is maintained. It is noted that Doane discloses a biodegradable molded expanded article with a thermally softened coating film applied to the biodegradable molded article. Further, the biodegradable molded expanded articles of Doane and that of Applicant comprise starch wherein the starch contains high-amylose starch. Additionally, it is noted that the molded article of Doane as shown in Figure 2 is formed

of a foamed material. To the Examiner the foamed material would inherently have an irregular surface (e.g. rough surface). Moreover, the Examiner sees no difference in the performance characteristics (e.g. adhesion between the surface of the molded article and the coating film) between the coated biodegradable expanded molded articles of Applicant and that of the presently claimed invention. Thus, to the Examiner final products of Applicant and that of Doane are equivalent.

11. Claims 7 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doane et al. (US 5,861,216) in view of Bradt (US 5,888,599) substantially as set forth in Section 6 of 11/27/07 Office Action.

12. Claims 1, 3, 6, 9-12, 14, and 17-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over CA 2 143 432 (CA432) in view of Doane et al. (US 5,861,216).

13. Regarding claims 1 and 3, CA432 discloses a biodegradable laminated composite material (a biodegradable molded article) based on a cured starch form (a biodegradable expanded molded article molded in a specified shape), wherein during the preparation the starch foam; the foam is simultaneously combined with an additional layer of a further material (abstract) such as films from synthetic and biopolymeric materials (page 3). Moreover, CA432 discloses "The method of the invention is based on a starch suspension which may contain native and/or modified starch. The native starch may be of any origin in natural or hybrid form and derived, for example, from potatoes, manioc, rice, corn, wax corn, **corn with high amylose content**, grain such as

wheat and fractions prepared therefrom, barley or sorghum. The modified starch is a physically and/or chemically produced starch derivative. Preferred are **aqueous starch suspensions** that may be mixed with dyes compatible with food stuff." (page 3).

14. As to the claim limitation of the biodegradable expanded molded article having irregular surface and "a thermally softened coating film...during the expansion molding so as to maintain the irregular surface of the biodegradable expanded molded article", it is reasonable to presume that said features are necessarily present in the biodegradable expanded molded article of CA432. The support for said presumption is based on the fact that the biodegradable expanded molded articles of Applicant and that of CA432 are produced by similar processes, specifically the biodegradable articles of Applicant and that of CA432 are formed using steam expansion molding and the coating films of Applicant and that of CA432 are attached to the surface of the biodegradable article during the expansion molding. For example, CA432 discloses "The starch suspension is preferably introduced in the die by injection and in measured amounts. In the heated mold the suspension foams following evaporation and fills the cavities. During that time and during the drying and chemicophysical curing processes the starch is combined with the further laminate material to form a unit that is subsequently released from the mold as laminated composite material. These processes are promoted by the increased internal pressure in the die and preferably conducted while controlling pressure and temperature." (pages 3-4). This disclosure of CA432 reads on the steam expansion molding as claimed. Thus, the presently claimed features would

be present in the biodegradable molded article of CA432. The burden is shifted to Applicant to prove it otherwise (*In re Fitzgerald*, 205 USPQ 594).

15. Regarding claims 1 and 3, the difference between the claimed invention and the prior art of CA432 is that CA432 is silent as to teaching the thermally softened coating film being mainly made of a biodegradable plastic and having at least hydrophobicity, and biodegradable expanded molded article having polyvinyl alcohol (claim 3).

16. However, Doane discloses biodegradable article that is formed of starch and polyvinyl alcohol and it is in expanded form (abstract). Further, the expanded biodegradable article of Doane has a self-adherent, moisture resistant hydroxy-functional polyester coating film on the surface of the expanded biodegradable article (abstract and column 3 lines 1-50). It is noted that Doane discloses "When applying the hydroxy-functional polyester layer, some melting of the polymer will be necessary to adhere onto the surface of the self-supporting structure." (column 7 lines 15-25). Further, Doane discloses that the coating film of his invention when applied to the exterior surface of an article, will provide substantial water resistance to the article (column 3 lines 26-35). It is noted that the primary reference of CA432 discloses of laminating films from synthetic or biopolymeric materials to the biodegradable expanded molded article of CA432, but does not teach or suggest a specific film. The secondary reference of Doane discloses a coating film when applied to an exterior surface of a biodegradable article; it will provide substantial water resistance to the biodegradable article. Thus, with respect to claim 1, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the thermally softened coating

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film of Doane, in the invention of CA432, motivated by the desire to provide water resistance to the biodegradable molded article of CA432. Additionally, the biodegradable expanded molded article of Doane that is in the form of a self-supporting structure such as foam or film, includes a natural polymer such as starch (column 2 lines 30-35). According to Doane "Structures that include natural polymer such as starch may preferably also include a polyol such as polyvinyl alcohol, because starch itself has poor strength and flexibility properties. Blends of starch and polyvinyl alcohol have long been known" (column 10 lines 1-8). It is noted that the biodegradable expanded molded article of CA432 includes starch, but PVOH is not included in the biodegradable expanded molded article of CA432. Thus, regarding claim 3, it would have been obvious to one having ordinary skill in the art at the time the invention was made to add polyvinyl alcohol in the starch, motivated by the desire to provide strength and flexibility properties to the biodegradable expanded molded article.

17. Regarding claims 6 and 14, it is noted that the secondary reference of Doane discloses a self-adherent, moisture resistant hydroxy-functional polyester (modified polyester) coating film (abstract). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the moisture resistant coating film of Doane that is formed of modified polyester, in the invention of CA432, motivated by the desire to provide water resistance to the biodegradable expanded molded article of CA432.

18. With respect to claims 9 and 17, although CA432 does not teach that the expanded molded article accounts for not less than 60 weight% of total weight of the

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biodegradable molded article, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the expanded molded article that accounts for not less than 60 weight% of total weight of the biodegradable molded article, motivated by the desire to form a biodegradable article that has suitable strength.

19. Regarding claims 10 and 18, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a molding material containing water which accounts for 20 to 70 weight%, motivated by the desire to uniformly agitate and adequately mix the molding material containing starch and water.

20. Regarding claims 12 and 20, it would have been obvious to one having ordinary skill in the art at the time the invention was made to control the amount of water in the range of 3 wt% to 20 wt% in biodegradable molded expanded articles, motivated by the desire to control the strength of the expanded article. This is evidenced by JP 05-320401 (copy of the abstract previously provided by the Examiner).

21. Regarding claims 21 and 22, as to the claim limitation of irregular surface of the biodegradable expanded molded article includes bumps and dips, as set forth above, this limitation would be necessarily present in the biodegradable expanded molded article of CA432 because biodegradable expanded molded articles of Applicant and that of CA432 are produced by similar processes.

22. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over CA 2 143 432 (CA432) in view of Doane et al. (US 5,861,216) as applied to claim 1 above, and further in view of Altieri (US 5,153,037).

23. CA432 is silent as to teaching starch and a derivative thereof contains not less than 50 weight % high-amylose starch or a derivative thereof. However, Altieri teaches biodegradable shaped products comprising expanded modified flour products, preferably having high amylose content, and having a low density, closed cell structure with good resilience and compressibility properties. More particularly, the expanded starch products of Altieri's invention, which includes packaging products and packaging material, has at least 45% by weight amylose content (column 2, lines 60-68). Further, Altieri teaches amylose content of at least 65% by weight (column 4, line 29). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the high amylose containing starch as taught by Altieri in the invention of CA432, motivated by the desire to form a compressible and crush resistant article.

24. Claims 4, 5, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over CA 2 143 432 (CA432) in view of Doane et al. (US 5,861,216) as applied to claim 3 above, and further in view of Shogren et al. (US 6,146,573).

25. The invention of CA432 is previously disclosed. CA432 is silent as to teaching polymerization degree of polyvinyl alcohol of not less than 1000 (claim 4) and polyvinyl alcohol having saponification degree of not less than 75% (claims 5 and 13). However, Shogren teaches disposable, molded articles such as cups, fast-food packages, trays

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etc. (abstract) produced by starch-based backing composition. Further, the backing composition of Shogren comprises polyvinyl alcohol with degree of polymerization over 1600 (abstract) and degree of saponification of less than or equal to 95.5 (column 4, lines 29-35). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the polyvinyl alcohol with degree of polymerization of over 1600 and saponification degree of less than or equal to 95.5, motivated by the desire to obtain article with improved flexibility and increased water resistance.

26. Claims 7 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over CA 2 143 432 (CA432) in view of Doane et al. (US 5,861,216) as applied to claims 1 and 3, and further in view of Bradt (US 5,888,599).

27. CA432 is silent as to teaching coating film is biaxially stretched. However, Bradt teaches multi-layer lidding film and a package with the lidding film heat-sealed thereto as a cover (abstract). The multi-layer lidding film of Bradt comprises a biaxially oriented polyester film (column 3, lines 19-21). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to biaxially stretch the coating film, motivated by the desire to enhance the strength of the coating film.

28. Claims 8 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over CA 2 143 432 (CA432) in view of Doane et al. (US 5,861,216) as applied to claims 1 and 3, and further in view of Ando et al. (US 5,639,518).

29. CA432 is silent as to teaching molding material containing water-insoluble fiber. However, Ando discloses a method for manufacturing biodegradable molded articles (column 1 lines 5-7). Further, Ando discloses addition of glass and metal fibers to the molded article of his/her invention as strength adjusting materials (column 10 lines 11-13). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to add the water-insoluble fibers to the molding material, motivated by the desire to adjust the strength of the expanded molded article.

Response to Arguments

30. Applicant's arguments received on 02/27/08 have been fully considered but they are not persuasive.

31. With respect to 35 USC Section 102(b)/103(a) rejections based on Doane et al. (US 5,861,216), Applicant argues that "In a specific example of the application...as recited by the amended claims 1 and 3.". Further Applicant asserts that "Applicant further submit that the above process creates much weaker adhesion between the BIS Adipic film and starch and PVOH blended film because the attachment...shape...Applicant submit that all of these techniques suffer from the same problem-namely weak adhesion created by attaching the hydroxyl-functional polyester layer 14 after the formation of the self-structure 12.". According to Applicant "Thus, because Doane only teaches techniques for adhering the hydroxyl-functional polyester layer 14 to the self-supporting structure 12 after the formation of the self-supporting structure 12, and because these techniques may include compression, Doane cannot

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teach or suggest strong coating adherence provided by "a thermally softened coating film attached to the irregular surface of the biodegradable expanded molded article during the expansion molding so as to maintain the irregular surface...during the expansion molding so as to maintain the irregular surface of the...article" as recited by amended claims 1 and 3." The Examiner respectfully disagrees for following reasons:

32. It is noted that Applicant has asserted that Doane discloses application of the hydroxy-functional polyester layer 14 specifically a method of adhering BIS Adipic film to an existing starch and PVOH blended film by a compression process and this process creates smoother interface between the BIS Adipic film and the starch and PVOH blended film (column 13 lines 15-19). The Examiner respectfully disagrees with Applicant's arguments based on the aforementioned citation of Doane, because Applicant's arguments are not commensurate in scope with the claimed invention. The claimed invention requires that the coating film is attached to an **expanded** molded article. The portions (e.g. column 13 lines 15-19) of Doane cited by Applicant disclose application of the coating film of Doane (i.e. BIS Adipic film) to starch and PVOH blended film (not to a foamed expanded article of Doane). The starch and PVOH blended film of Doane is not expanded article. Additionally, as to the arguments regarding strong coating adherence, these arguments are not commensurate in scope with the claimed invention, because claimed invention does not require that the adhesion be strong between the coating film and biodegradable expanded molded article. Further, Doane discloses that the articles of his invention typically do not delaminate even when soaked in water (see abstract). Thus, the Examiner sees no

difference in performance characteristics (e.g. adhesion between the surface of the molded article and the coating film) between the coated biodegradable articles of Applicant and that of Doane. Accordingly, it is respectfully submitted that Applicant's arguments are not found persuasive.

33. Applicant does not agree with the Examiner's position that the foamed material inherently have an irregular surface and that it is known that no surface is perfectly smooth. Applicant argues that as shown in Figure 12(a) of the presently claimed invention where a coating film 12 may be attached by an adhesive layer 13 to an expanded molded article 11 using an after attaching method, the surface of the molded article 11 created by after attaching method becomes smooth and thus does not possess "an irregular surface". The Examiner respectfully disagrees, because the Examiner is not relying on attachment of the coating film of Doane using an adhesive to the expanded molded article of Doane. It is noted that Doane's coating film 14 is directly adhered to the expanded molded article 12 (see Figure 2). Moreover, as set forth above in Sections 9 and 10, the Examiner sees no difference in performance characteristics (e.g. adhesion between the surface of the molded article and a coating film) between the coated biodegradable articles of Applicant and that of the presently claimed invention. Accordingly, Applicant's arguments are not found persuasive. Accordingly, the art rejections are maintained.

34. With respect to the 35 USC Section 103(a) rejections based on Doane in view of Bradt (US 5, 888,599), it is noted that Applicant has generally asserted his/her

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disagreement with the Examiner's rejection, but did not specifically pointed out the errors in the Examiner's rejection. Therefore, the Examiner's comments set forth above in this and in the previous Office Action are equally pertinent to this rejection as well. Accordingly, art rejections are maintained.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANISH DESAI whose telephone number is (571)272-6467. The examiner can normally be reached on Monday-Friday, 8:00AM-4:30PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on 571-272-1284. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. D./
Examiner, Art Unit 1794

/Hai Vo/
Primary Examiner, Art Unit 1794